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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,194	11/09/2001	Haruyama Shinichi	678-0756	6677

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EXAMINER	
JAMAL, ALEXANDER	
ART UNIT	PAPER NUMBER
2614	
MAIL DATE	DELIVERY MODE
06/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/037,194	SHINICHI ET AL.	
	Examiner	Art Unit	
	ALEXANDER JAMAL	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Based upon the submitted amendment the examiner notes that claims 1,3,4,6 have been amended.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 3-5** rejected under 35 U.S.C. 103(a) as being unpatentable over Tran (6184833) and further in view of Perlick et al. US 20020159214 A1).

As per **claims 3,4,** Tran discloses a portable phone (Figs. 14a,14b) with a dual strip antenna (dipole antenna pattern) arranged on a PCB surface (Col 6 line 61 to Col 7 line 5). Tran discloses the antenna may be micro-etched onto one side of a printed circuit board (a second surface) (Col 6 lines 65-68). Tran additionally discloses that the antenna may be mounted opposite to a mounted speaker in the device (Col 5 lines 45-55) (Col 10

lines 5-20). Examiner reads a PCB as any structure that supports said speaker (a first surface), and notes that mounting an antenna behind a speaker would be on the opposite side of the PCB that supports and electrically couples said speaker. The examiner notes that any supporting structure for the dual strip antenna (such as the 'ground plane' noted in Col 6 lines 60-65) could be considered an 'antenna board' as used in claim 4. Tran's phones comprise antennas that are used to radiate waves (Col 1 lines 20-25). A wave comprises a modulated voltage/current signal that will 'resonate' at whatever frequencies are being transmitted. Any modulated data that is transmitted from the phone will require 'resonant current' in order to produce the frequencies for whatever signaling protocol is being used. The device is a portable telephone that runs from a battery. As such, no earth current will flow to or from the device. However, Tran does not specify the exact layout of the circuitry and PCB's, Including a balun interconnected between the PCB with the speaker/phase control means and the antenna board.

Perlick teaches that coupling transformers (a balun comprises a transformer) between two pcb's aids in miniaturization. It would have been obvious to one of ordinary skill in the art at the time of this application first that the phase control circuitry could be located on any suitable pcb as a matter of design choice, and that the Baluns could be coupled between the antennas and speaker on two separate PCB's for the advantage Of aiding in miniaturization.

As per **claim 5,** the antenna (and it's dielectric) form a multi-layered structure to be mounted on the PCB (Fig. 4).

4. **Claim 8** rejected under 35 U.S.C. 103(a) as being unpatentable over Tran (6184833) in view of Perlick et al. (US 20020159214 A1), as applied to claim 3, and further in view of Tran (6215454).

As per **claim 8,** Tran and Perlick disclose a portable phone as per the claim 3 rejection, but does not specify the shielding (ground layer) being made of glass epoxy.

Tran teaches a PCB that provides shielding planes for multi-layer antenna (antenna mounted thereon). (Col 16 lines 55-67). The shielding layers may be set on any layer of the PCB (Col 19 lines 5-25). Tran teaches that epoxies (which would include glass epoxy) may be used to form the layers (Col 20 lines 10-35). It would have been obvious to one of ordinary skill in the art at the time of this application to implement shielding layers upon which the antenna are mounted on for the purpose of reducing the radiated RF signals.

5. **Claims 1,2** rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (6615026), and further in view of Thill (5678201) and further in view of Tran (6215454), and further in view of Perlick et al. US 20020159214 A1).

As per **claim 1,** Wong discloses a plurality of antennas with each antenna coupled to power-feed phase control means (Col 3 lines 40-60, Fig. 5). The antennas are dipole antennas (Col 2 lines 45-57). Wong discloses that a radiation pattern is controlled to

reduce the exposure of the human head to the radiation. The radiation pattern is controlled by controlling the amplitude or phase of the radiating elements which will control the phase and amplitude of any current fed into the antennas. Electromagnetic waveforms cancel each out when they collide (it is a property inherent to waveforms). The cumulative radiation dispersion from an antenna array is comprised of the individual antenna radiations canceling and adding to each other. Since Wong discloses controlling the phase of each antenna in order to direct the overall radiation away from the user's head, his system comprises controlling phase to cancel the waves in the vicinity of the user's head. Wong's phones comprise antennas that are used to radiate waves (Col 1 lines 10-25). A wave comprises a modulated voltage/current signal that will 'resonate' at whatever frequencies are being transmitted. Any modulated data that is transmitted from the phone will require 'resonant current' in order to produce the frequencies for whatever signaling protocol is being used. Examiner notes that this device is a portable phone which uses a battery and as such, no earth current will flow through any part of the device. However, Wong does not disclose each antenna coupled to an individual BALUN, or that the antennas are mounted on a shield plate, or specify the exact layout of the circuitry and PCB's, including a balun interconnected between the PCB with the speaker/phase control means and the antenna board.

Thill teaches the well known concept of using a BALUN coupled to an individual radio antenna (ABSTRACT). Thill teaches that a BALUN acts to match impedance characteristics between an antenna and the driving or receiving circuitry (Col 1 lines 10-35). It would have been obvious to one of ordinary skill in the art at the time of this

application that each antenna could be coupled with a BALUN for the purpose of matching impedances between each stage in the circuit.

Tran teaches a PCB that provides shielding planes for multi-layer antenna (antenna mounted thereon). (Col 16 lines 55-67). The shielding layers may be set on any layer of the PCB (Col 19 lines 5-25). Tran teaches that epoxies (which would include glass epoxy) may be used to form the layers (Col 20 lines 10-35). It would have been obvious to one of ordinary skill in the art at the time of this application to implement shielding layers upon which the antenna are mounted on for the purpose of reducing the radiated RF signals.

Perlick teaches that coupling transformers (a balun comprises a transformer) between two pcb's aids in miniaturization. It would have been obvious to one of ordinary skill in the art at the time of this application first that the phase control circuitry could be located on any suitable pcb as a matter of design choice, and that the Baluns could be coupled between the antennas and speaker on two separate PCB's for the advantage Of aiding in miniaturization.

As per **claim 2,** the phase control means will adjust the power distribution ratio by varying the phases (and as such, the amplitudes) of each respective antenna signal. Wong further discloses directly controlling the amplitude of the radiating element which will also control the power distribution ratio of any current fed into the antennas. (Col 3 lines 40-45).

As per **claim 7,** Tran discloses that glass epoxy may be used.

6. **Claims 6,9** rejected under 35 U.S.C. 103(a) as being unpatentable over Tran (6184833), and further in view of Perlick et al. US 20020159214 A1), and further in view of Wong (6615026) and further in view of Thill (5678201) and further in view of Tran (6215454)..

As per **claim 6,** Tran and Perlick disclose a portable phone comprising a dipole antenna mounted on a PCB opposite a speaker (as per claim 3-5 rejections). Examiner notes that this device is a portable phone which uses a battery and as such, no earth current will flow through any part of the device. However, Tran does not disclose that the antenna is a set of dipole antennas that are fed the same power through phase control means, or that each antenna is coupled to an individual BALUN, or that the antennas are mounted on a shield plate.

Wong discloses a plurality of antennas with each antenna coupled to phase control means as per the rejection of claims 1,2. Wong further teaches that an array of phase controlled antennas may be used to control the direction of the radiated energy (Col 3 lines 40-60) and allow for better reception. It would have been obvious to one of ordinary skill in the art at the time of this application that an array of antennas with phase controlled power-feed could be used in the portable phone for the advantage of greater control of the radiated signals and allowing greater transmission energy to be steered towards a base station away from the user's head.

Thill teaches the well known concept of using a BALUN coupled to an individual radio antenna (ABSTRACT). Thill teaches that a BALUN acts to match impedance

characteristics between an antenna and the driving or receiving circuitry (Col 1 lines 10-35). It would have been obvious to one of ordinary skill in the art at the time of this application that each antenna could be coupled with a BALUN for the purpose of matching impedances between each stage in the circuit.

Tran teaches a PCB that provides shielding planes for multi-layer antenna (antenna mounted thereon). (Col 16 lines 55-67). The shielding layers may be set on any layer of the PCB (Col 19 lines 5-25). Tran teaches that epoxies (which would include glass epoxy) may be used to form the layers (Col 20 lines 10-35). It would have been obvious to one of ordinary skill in the art at the time of this application to implement shielding layers upon which the antenna are mounted on for the purpose of reducing the radiated RF signals.

As per **claim 9,** Tran discloses that glass epoxy may be used.

Response to Arguments

7. Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

/Alexander Jamal/

Primary Examiner, Art Unit 2614

Examiner Alexander Jamal

June 3, 2008